UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/559,531 | 12/02/2005 | Yutaka Takeuchi | 025416-00024 | 2704 |

4372 7590 11/04/2009

ARENT FOX LLP
1050 CONNECTICUT AVENUE, N.W.
SUITE 400
WASHINGTON, DC 20036

| EXAMINER | |
|---|---|
| ZHU, WEIPING | |
| ART UNIT | PAPER NUMBER |
| 1793 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 11/04/2009 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DCIPDocket@arentfox.com
IPMatters@arentfox.com
Patent_Mail@arentfox.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/559,531 | TAKEUCHI ET AL. | |
| | Examiner | Art Unit | |
| | WEIPING ZHU | 1793 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *25 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *13-23* is/are pending in the application.

4a) Of the above claim(s) *20-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/14/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Status of Claims*

1. Claims 13-19 are currently under examination, wherein the claims 13, 16 and 19 have been amended in applicant's amendment filed on August 25, 2009.

### *Status of Previous Rejections*

2. The previous rejections of claims 13-19 under 35 U.S.C. 103(a) as stated in the Office action dated April 21st, 2009 are maintained as follows:

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kajikawa et al. (US 4,309,227) in view of JP 2000-045061 as stated in the Office action dated April 21st, 2009.

With respect to the amended feature in the instant claim 13, Kajikawa et al. ('227) discloses a second step of decreasing the voltage (i.e. the current density as claimed) after a temperature of the workpiece is in the range of 300° C to 400° C (i.e. upon a temperature of the workpiece initially arriving above 350° C) and then heating the workpiece up to a desired nitriding treatment temperature by using a heating element. The temperature range of 300° C to 400° C as disclosed by Kajikawa et al. ('227)

overlaps the claimed temperature range of above 350° C. A prima facie case of obviousness exists. See MPEP 2144.05 I.

With respect to the amended feature in the instant claim 16, Kajikawa et al. ('227) discloses that the nitriding treatment temperature is maintained by the heating element to execute the nitriding treatment after the workpiece arrives at the desired nitriding treatment temperature in the second step (col. 5, lines 6-12).

4. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kajikawa et al. (US 4,309,277) in view of JP 2000-045061 as applied to claim 13 above and further in view of JP 09-079912 as stated in the Office action dated April 21st, 2009.

With respect to the amended feature in the instant claim 19, It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect the difference between the radiation and the contact temperatures of a dummy workpiece arranged in the heat treatment furnace of Kajikawa et al. ('227) in view of JP ('061) during the entire heat treatment process of Kajikawa et al. ('227) in view of JP ('061) in order to correct the radiation temperature of the workpiece detected simultaneously with the difference and determine the real surface temperature of the workpiece during the entire heat treatment process of Kajikawa et al. ('227) in view of JP ('061).

***Response to Arguments***

5. The applicant's arguments filed on August 25, 2009 have been fully considered but they are not persuasive.

First, the applicant argues that the examiner cannot ignore the teachings of the drawings and Kajikawa et al. ('227) does not teach first step of applying a voltage between the furnace and the workpiece to start heating the workpiece by means of generated glow discharge as specifically claimed in the instant claim 13. In response, the examiner notes that he did not ignore the teachings of the drawings by pointing out that the Figures 3 and 4 of Kajikawa et al. ('227) are only diagrammatic and they do not completely agree with what is described in the specification in terms of the heat-radiating element output and glow discharge voltage level at different stages of the nitriding process. Figures 3 and 4 of Kajikawa et al. ('227) show that the glow discharge voltage is applied after the heating element AC voltage to start heating the workpiece while Kajikawa et al. ('227) discloses in the specification that the AC voltage is applied to the element 4 to make it generate heat and further DC voltage is applied to the electrodes by means of the source 7 to produce a glow discharge; through the glow discharge as well as the heat generated by the element 4, the workpiece is heated up to a minimum temperature at which the workpiece can be nitrided by means of a glow discharge (col. 4, lines 18-29), which obviously meets the claim limitation in the instant claim 13. The instant claim 13 does not limit starting heating the workpiece by means of generated glow discharge alone.

Second, the applicant argues that Fig. 4 of Kajikawa et al. ('227) clearly shows at time t2 that the glow discharge voltage is not decreased and that the heating of the workpiece up to the desired nitriding temperature is not done by using a heating element. In response, the examiner notes that Fig. 4 of Kajikawa et al. ('227) clearly

shows at times t2 and t3 that the glow discharge voltage is decreased and that the heating of the workpiece up to the desired nitriding temperature is done by using a heating element and a glow discharge.

Third, the applicant argues that Kajikawa et al. ('227) does not teach heating is effected in the second step such that an amount of heat generated by the heating element is higher than that at any time in the first step as claimed. In response, see the response to applicant's 1st argument above. The examiner notes that Kajikawa et al. ('227) discloses that at the beginning of the second step the voltage level of the glow discharge is dropped from 700 V in the first step to 540 V while the workpiece is further heated up to the optimum temperature and , indicating it likely that the heat generated by the heating element in the beginning of the second step is higher than that at any time in the first step as claimed (col. 4, lines 11 to col. 5, line 12).

Fourth, the applicant argues that there is no teaching of a gradual decrease of the DC voltage generating the glow discharge in Figures 3 and 4 of Kajikawa et al. ('227). In response, see the response to applicant's 1st argument above. It would have been obvious to one of ordinary skill in the art that the decrease of the glow discharge voltage would be gradual in order to prevent abrupt changes of the heat input.

Fifth, the applicant argues that there is no teaching of record of the use of a dummy workpiece; there is no teaching of record that the simple thermocouple 10 is inadequate; and no rational reason has been given for the combination of JP ('912) and Kajikawa et al. ('227) in view of JP ('061). In response, the examiner notes that the sample 1 as disclosed by JP ('912) (abstract) reads on the claimed dummy workpiece. It

would have been obvious to one of ordinary skill in the art to measure the contact and radiation temperatures of a dummy disposed in the environment wherein a workpiece is disposed to derive at a temperature correction factor in order to correct the radiation temperature of the workpiece detected simultaneously with the correction factor and determine the real surface temperature of the workpiece as desired as disclosed by JP ('912) (abstract). The combination of Kajikawa et al. ('227) in view of JP ('061) and JP ('912) with a proper motivation as stated in the Office action dated April 21st, 2009 renders the feature in instant claim 19 obvious to one of ordinary skill in the art.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

WZ

9/10/2009